

CLAIMS

What is claimed is:

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1. A cathode plate of a field emission display comprising:
a cathode substrate of the field emission display; and
a plurality of emitter lines formed on the cathode substrate.

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2. The cathode plate of Claim 1 further comprising a plurality of linear isolation barriers attached to the cathode substrate, wherein the plurality of linear isolation barriers separate a respective one or more of the plurality of emitter lines from others of the plurality of emitter lines.

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3. The field emission display of Claim 2 wherein the linear isolation barriers are adapted to contact a plurality of gate wires of a gate frame and dampen vibrations from a driving frequency.

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4. The cathode plate of Claim 2 wherein each one of the plurality of emitter lines is positioned between a respective two of the plurality of linear isolation barriers.

5. The cathode plate of Claim 2 wherein the plurality of linear isolation barriers comprise a plurality of ribs.

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6. The cathode plate of Claim 1 further comprising a plurality of in-laid isolation barriers formed with a depth of a top surface of the cathode substrate, wherein each one or more of the plurality of emitter lines is formed within a respective one of the plurality of in-laid isolation barriers.

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7. The cathode plate of Claim 6 wherein portions of the top surface of the cathode substrate in between respective ones of the plurality of in-laid linear isolation barriers are adapted to contact a plurality of gate wires of a gate frame and dampen vibrations from a driving frequency.

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8. The cathode plate of Claim 6 wherein each one of the plurality of emitter lines is positioned within the respective one of the plurality of in-laid isolation barriers.

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9. The cathode plate of Claim 6 wherein the plurality of in-laid isolation barriers comprises a plurality of trenches.

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10. The cathode plate of Claim 1 further comprising an alignment barrier attached to the cathode substrate for positionally aligning other components of the field emission display on the cathode substrate.

11. The cathode plate of Claim 1 wherein the plurality of emitter lines each comprise a substantially smooth layer of electron emitting material formed on the cathode substrate.

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12. The cathode plate of Claim 1 wherein the plurality of emitter lines each comprise a plurality of conical emitters deposited closely together in a linear fashion on the cathode substrate.

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13. The cathode plate of Claim 1 wherein the plurality of emitter lines each comprise a plurality of emitter portions deposited on a surface of the cathode substrate, wherein there is no separating structure positioned in between adjacent emitter portions on the surface of the cathode substrate.

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14. The cathode plate of Claim 1 wherein the plurality of emitter

lines each comprise a continuous line of deposited emitter material extending across the cathode substrate.

15. An anode plate of a field emission display comprising:
5 a transparent piece of the field emission display; and
a plurality of phosphor lines formed on the transparent piece,
wherein the plurality of phosphor lines are to be aligned with and receive
electrons from a plurality of emitter lines of a cathode substrate of the field
emission display.

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16. The anode plate of Claim 14 further comprising an anode
material formed to contact the plurality of phosphor lines, wherein a potential
applied to the anode material accelerates the electrons from the plurality of
emitter lines.

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17. A method of providing a field emission display comprising:
providing a cathode substrate including a plurality of emitter
lines formed on the cathode substrate;

20 providing a gate frame positioned over the cathode substrate,
the gate frame including a plurality of gate wires; and
providing an anode plate including a plurality of phosphor lines
positioned over the gate frame, the plurality of phosphor lines aligned with
the plurality of emitter lines.

18. A method of making a field emission display comprising:
5 providing a cathode substrate;
depositing a plurality of emitter lines on the cathode substrate;
providing a gate frame including a plurality of gate wires; and
positioning the gate frame over the cathode substrate.

19. The method of Claim 18 further comprising:
10 providing an anode plate;
depositing a plurality of phosphor lines on a surface of the
anode plate; and
positioning the anode plate over the gate frame, the plurality of
phosphor lines aligned with the plurality of emitter lines.

20. The method of Claim 19 further comprising:
15 sealing the cathode substrate, the gate frame and the anode plate
together.

21. The method of Claim 19 further comprising:
20 sealing a volume formed between the cathode substrate and the
anode plate in a vacuum.

22. The method of Claim 18 wherein the positioning the gate
frame comprises:
25 positioning the gate frame over the cathode substrate such that
the gate wires cross over the plurality of emitter lines.

23. The method of Claim 18 further comprising:
30 forming a plurality of linear isolation barriers on the cathode
substrate, wherein the plurality of linear isolation barriers separate emitter
lines from each other.

24. The method of Claim 23 wherein the positioning the gate frame step comprises:

positioning the gate frame over the cathode substrate such that
5 the linear isolation barriers contact the gate wires and dampen vibrations in
the gate wires from a driving frequency.

25. The method of Claim 23 wherein the forming the plurality of linear isolation barriers comprises:

10 forming the plurality of linear isolation barriers on the cathode substrate such that each emitter line is positioned between a respective pair of linear isolation barriers.

26. The method of Claim 18 further comprising:

15 forming a plurality of in-laid isolation barriers within a depth of a top surface of the cathode substrate, wherein each emitter line is formed within a respective in-laid isolation barrier.

27. The method of Claim 26 wherein positioning the gate frame
20 step comprises:

positioning the gate frame over the cathode substrate such that portions of the top surface of the cathode substrate in between the in-laid linear isolation barriers contact portions of the gate wires of the gate frame and dampen vibrations in the gate wires from a driving frequency.

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28. The method of Claim 18 further comprising:

coupling a first alignment barrier to the cathode substrate for aligning the gate frame on the cathode substrate while positioning the gate frame.

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29. The method of Claim 19 further comprising:
coupling a second alignment barrier to the gate frame for
aligning the anode plate on the gate frame while positioning the anode plate.

5 30. The method of Claim 18 wherein the depositing the
plurality of emitter lines comprises:
depositing the plurality of emitter lines such that each emitter
line comprises a substantially smooth layer of electron emitting material on
the cathode substrate.

10 31. The method of Claim 18 wherein the depositing the
plurality of emitter lines comprises:
depositing the plurality of emitter lines such that each emitter
line comprises a plurality of conical emitters deposited closely together in a
15 linear fashion on the cathode substrate.

32. The method of Claim 18 wherein the depositing the
plurality of emitter lines comprises:
depositing the plurality of emitter lines such that each emitter
line comprises a plurality of emitter portions deposited on a surface of the
cathode substrate, wherein there is no separating structure positioned in
20 between adjacent emitter portions on the surface of the cathode substrate.

25 33. The method of Claim 18 wherein the depositing the
plurality of emitter lines comprises:
depositing the plurality of emitter lines such that each emitter
line comprises a continuous line of deposited emitter material extending
across the cathode substrate.

34. A method of operating a field emission display comprising:
applying a first voltage potential between an emitter line of a
cathode substrate and one or more gate wires of a gate frame positioned over
the cathode substrate;

5 generating an electric field over a portion of the emitter line
· below and in between the one or more gate wires; and
emitting electrons from the portion of the emitter line.

35. The method of Claim 34 further comprising:
10 applying a second voltage potential to an anode plate including
a plurality of phosphor lines;
whereby accelerating the electrons emitted toward a phosphor
line.

37. The method of Claim 34 further comprising:
isolating the electrons emitted from adjacent emitter lines
20 formed on the cathode substrate.

38. The method of Claim 34 further comprising:
contacting the one or more gate wires to dampen vibrations in
the gate wires from a driving frequency.

40. The method of Claim 34 wherein the emitter line is located
30 within an in-laid isolation barrier of the cathode substrate.

41. The method of Claim 34 wherein the emitter line comprises a substantially smooth layer of electron emitting material on the cathode substrate.

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42. The method of Claim 34 wherein the emitter line comprises a plurality of conical emitters deposited closely together in a linear fashion on the cathode substrate.

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43. The method of Claim 34 wherein the emitter line comprises a plurality of emitter portions deposited on a surface of the cathode substrate, wherein there is no separating structure positioned in between adjacent emitter portions on the surface of the cathode substrate.

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44. The method of Claim 34 wherein the emitter line comprises a continuous line of deposited emitter material extending across the cathode substrate.